IN THE CLAIMS:

Claim 1. (currently amended) [A method for adapting a] An adaptive linear system[s] to adapt a set of complex valued observations [with a Least Square Solver (LESS)] having adaptation parameters with complex-valued elements, comprising [the steps of]:

a complex Least Square Solver (LESS), having:

means for transforming [said] adaptation [parameters] observations from a complex arithmetic to two sets of real number arithmetic observations by means of binary orthogonalization transformation (BOT).

means for computing with two real number LESS [said] two sets of real number arithmetic adaptation parameters; and

means for transforming after said computing with LESS said two sets of real [computation] adaptation parameters to a set of complex number arithmetic adaptation parameters using an inverse binary orthogonalization transform (IBOT).

Claim 2. (currently amended) The [method] adaptive linear system as described in claim 1, wherein said means of computing of said two sets of real number [arithmetic] LESS are applied in parallel.

Claim 3. (currently amended) The [method] adaptive linear system as described in claim 1, wherein said means of computing of said two sets of real number [computation] LESS are applied in series.

Claim 4. (currently amended) The [method] adaptive linear system as described in claim 1, wherein the LESS represents a Recursive Least Squares algorithm (RLS).

Claim [6]5. (currently amended) The [method] adaptive linear system as described in claim 1, wherein the LESS represents a Least Mean Squares (LMS) algorithm.

Claim [7]6. (currently amended) The [method] <u>adaptive linear system</u> as described in claim 1, wherein said LESS is a Householder transformation.

Claim [8]7. (currently amended) The [method] <u>adaptive linear system</u> as described in claim 1, wherein said LESS is a Cholesky decomposition.

Claim [9]. (canceled)

Claim [10]8. (currently amended) The [method] <u>adaptive linear system</u> as described in claim 1, wherein said LESS is <u>QR</u> Decomposition (QRD).

Claim [11]9. (currently amended) The [method] <u>adaptive linear system</u> as described in Claim 4, wherein the RLS is computed by a systolic array.

Claim [12]10. (currently amended) The [method] <u>adaptive linear system</u> as described in claim 1, wherein the LESS represents the group consisting of a Block Matched Filter Estimator (BMFE), a Block Zero Forcing Estimator (BZFE), and a Block Minimum Mean Square Error Estimator (BMMSEE).

Claim [13]11. (currently amended) The [method] <u>adaptive linear system</u> as described in claim [11]10, wherein the group is computed through the group consisting of a Cholesky decomposition [, a single valued deposition (SVD)] and a QR Decomposition (QRD).

Claim [14]12. (currently amended) The [method] <u>adaptive linear system</u> as described in claim 1, wherein said LESS is constrained as CLESS in that an initial BOT from complex number arithmetic to real number arithmetic is used; then two real computation, <u>Constrained Least Square Solver,</u> [CLESS] <u>(CLESS)</u> are applied, each one producing P output streams; and finally a corresponding number of P IBOT modules from real number arithmetic to complex number arithmetic are implemented.

Claim [15]13. (currently amended) The [method] adaptive linear system as described in claim 1, wherein said linear system is applied for the group consisting of temporal, spatial, joint temporal and spatial channel estimation.

Claim [16]14. (currently amended) The [method] adaptive linear system as described in claim 1, wherein said linear system is applied for the group consisting of temporal, spatial, joint temporal and spatial channel equalization.

Claim [17]15. (currently amended) The [method] adaptive linear system as described in claim 1, wherein said linear system is applied for [the group consisting of] carrier frequency estimation [Direction of Arrival (DOA), estimation, and joint carrier frequency and DOA estimation].

Claim [18]16. (currently amended) The [method] adaptive linear system as described in claim 1, wherein said linear system is an adaptive filter.

Claim [19]. (canceled)

Claim 17. (new). The adaptive linear system as described in claim 1, wherein said adaptive linear system is selected from the group consisting of channel estimation, system parameter estimation, channel equalization, recursive updating of output parameters, non-recursive updating of output parameters, and system identification.

IN THE REFERENCE (on page 13):

Transferred to Information Disclosure Statement form attached.